

# Transformation, Technology, and Education

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Why Transformation?

# Technological Reasons: Levels of Use

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## *Transformation*

Redefinition

Tech allows for the creation of new tasks, previously inconceivable

Integrated with workgroup and content management software

Modification

Tech allows for significant task redesign

Integrated with email, spreadsheets, graphing packages

Augmentation

Tech acts as direct tool substitute, with functional improvement

Basic functions (e.g., cut and paste, spellchecking) used

Substitution

Tech acts as direct tool substitute, with no functional change

Word processor used like a typewriter

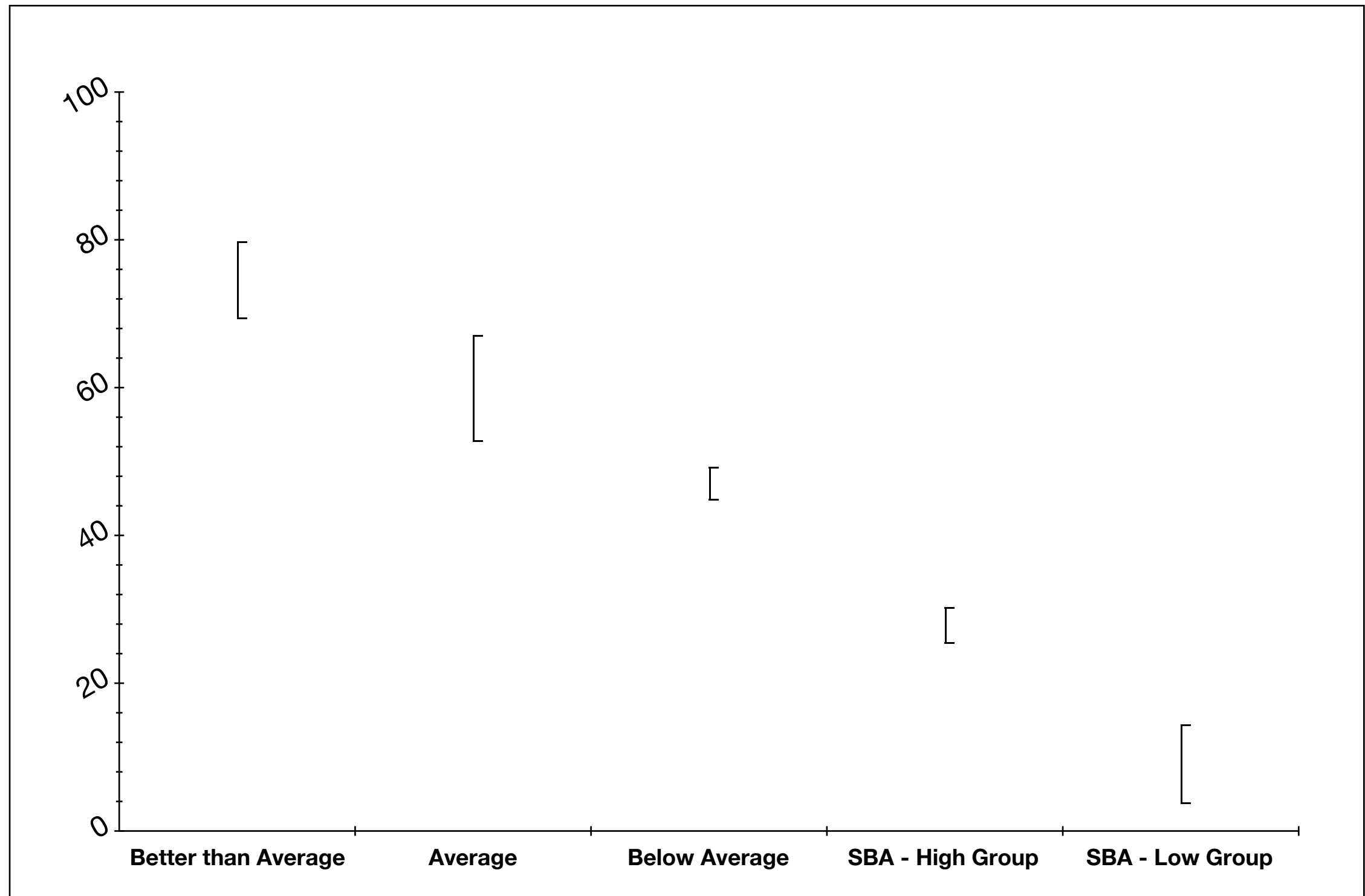
## *Enhancement*

# Social Reasons: the Meaning of PISA (1)

Performance of 15-Year-Old Students in Reading, Mathematics, and Science			
Better than Average	Average	Below Average	Substantially Below Average
Australia Canada Finland Hong Kong - China Japan Korea Liechtenstein Netherlands New Zealand	Austria Belgium Czech Republic Denmark France Germany Hungary Iceland Ireland Latvia Luxembourg Macao - China Norway Poland Slovak Republic Spain Sweden Switzerland United States	Greece Italy Portugal Russian Federation	High Group
			Serbia Thailand Turkey Uruguay
			Low Group
			Brazil Indonesia Mexico Tunisia

# Social Reasons: the Meaning of PISA (2)

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# How Can We Accomplish This Shift?

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- Bloom (1984): one-to-one tutoring by experienced tutors produces a 2-Sigma gain in learning

Effect of Selected Alterable Variables on Student Achievement (Bloom 1984, Walberg 1984)			
Tutorial instruction	2.00	Initial cognitive prerequisites	0.60
Reinforcement	1.20	Home environment intervention	0.50
Feedback-corrective (Mastery Learning)	1.00	Peer and cross-age remedial tutoring	0.40
Cues and explanations	1.00	Homework (assigned)	0.30
Student classroom participation	1.00	Higher order questions	0.30
Student time on task	1.00	New science & math curricula	0.30
Improved reading/study skill	1.00	Teacher expectancy	0.30
Cooperative learning	0.80	Peer group influence	0.20
Homework (graded)	0.80	Advance organizers	0.20
Classroom morale	0.60		

Computer use effects: 0.4 - 2.0 Sigma

# Technological Avenues to Transformation

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- Visualization and Simulation
- Social Computing
- Digital Storytelling
- Educational Gaming

# Hippasus

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